

SEQUENCE LISTING

<110> Bellacosa, Alfonso

<120> Methods for Detection of Transition
Single-Nucleotide Polymorphisms

<130> FCCC 96-21

<140> 09/629,222

<141> 2000-07-31

<150> 09/463,891

<151> 2000-01-28

<150> PCT/US98/15828

<151> 1998-07-28

<150> 60/053,936

<151> 1997-07-28

<160> 73

<170> FastSEQ for Windows Version 3.0

<210> 1

<211> 2152

<212> DNA

<213> Homo sapiens

<400> 1

ggcggcgctct	ggggcgcttt	cgcaacattc	agacctcggt	tgcagcccg	tgccgtgagc	60
tgaagagggt	tcacatctta	ctccgcccc	cacctgggc	gttgccggc	tggtctcggt	120
gctgcagccg	gacctgtctc	gatgggcaag	actgggctgg	agagtctgag	tctgggggac	180
cgcggagctg	ccccaccgt	cacctctagt	gagcgcctag	tcccagacc	gccgaatgac	240
ctccgcaaag	aagatgttgc	tatggaattg	gaaagagtgg	gagaagatga	ggaacaaatg	300
atgataaaaa	gaagcagtga	atgtaatccc	ttgctacaag	aaccatcgc	ttctgctcag	360
tttggtgcta	ctgcaggaac	agaatgccgt	aagtctgtcc	catgtggatg	ggaaagagtt	420
gtgaagcaaa	ggttatttgg	gaagacagca	ggaagatttg	atgtgtactt	tatcagccca	480
caaggactga	agttcagatc	caaaagtcca	cttgcttaatt	atcttcacaa	aaatggagag	540
acttctctta	agccagaaga	ttttgatttt	actgtacttt	ctaaaagggg	tatcaagtca	600
agatataaag	actgcagcat	ggcagccctg	acatcccac	tacaaaacca	aagtaacaat	660
tcaaaactgga	acctcaggac	ccgaagcaag	tgcaaaaagg	atgtgtttat	gccgccaagt	720
agtagttcag	agttgcagga	gagcagagga	ctctctaaat	ttacttccac	tcatttgctt	780
ttgaaagaag	atgaggggtg	tgatgatgtt	aacttcagaa	agggttagaaa	gcccagaagg	840
aaggtgacta	ttttgaaagg	aatcccaatt	aagaaaacta	aaaaaggatg	taggaagagc	900
tgttcaggtt	ttgttcaaa	tgatagcaaa	agagaatctg	tgtgtaataa	agcagatgct	960
gaaagtgaac	ctgttgacac	aaaaagtcag	cttgatagaa	ctgtctgcat	ttctgatgct	1020
ggagcatgtg	gtgagaccct	cagtgtgacc	agtgaagaaa	acagccttgt	aaaaaaaaaa	1080
gaaagatcat	tgagttcagg	atcaaatatt	tgttctgaac	aaaaaacttc	tgccatcata	1140
aacaaatttt	gttcagccaa	agactcagaa	cacaacgaga	agtatgagga	taccttttta	1200
gaatctgaag	aaatcggaac	aaaagtagaa	gttgtggaaa	ggaaagaaca	tttgataact	1260
gaccttttaa	aacgtggctc	tgaaatggac	aacaactgct	caccaaccag	gaaagacttc	1320
actggtgaga	aaatatttca	agaagatacc	atcccacgaa	cacagataga	aagaaggaaa	1380
acaagcctgt	atttttccag	caaatataac	aaagaagctc	ttagccccc	acgacgtaaa	1440
gcctttaaga	aatggacacc	tcctcggtca	ccttttaatc	tcgttcaaga	aacacttttt	1500
catgatccat	ggaagcttct	catcgctact	atattttctc	atcggacctc	aggcaaaatg	1560
gcaatacctg	tgctttggaa	gtttctggag	aagtatcctt	cagctgaggt	agcaagaacc	1620
gcagactgga	gagatgtgtc	agaacttctt	aaacctcttg	gtctctacga	tcttcgggca	1680
aaaaccattg	tcaagttctc	agatgaatac	ctgacaaagc	agtggaaagta	tccaattgag	1740
cttcattgga	ttggtaaata	tggcaacgac	tcttaccgaa	ttttttgtgt	caatgagtgg	1800
aagcaggtgc	accctgaaga	ccacaaatta	aataaatatc	atgactggct	ttgggaaaat	1860
catgaaaaat	taagtttatc	ttaaactctg	cagctttcaa	gctcatctgt	tatgcatagc	1920
tttgcacttc	aaaaaagctt	aattaagtac	aaccaaccac	ctttccagcc	atagagattt	1980
taattagccc	aactagaagc	ctagtgtgtg	tgctttctta	atgtgtgtgc	caatggtgga	2040

tctttgctac tgaatgtgtt tgaacatggt ttgagatttt tttaaaaataa attattatttt 2100
gacaacaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aa 2152

<210> 2
<211> 580
<212> PRT
<213> Homo sapiens

<400> 2
Met Gly Thr Thr Gly Leu Glu Ser Leu Ser Leu Gly Asp Arg Gly Ala
1 5 10 15
Ala Pro Thr Val Thr Ser Ser Glu Arg Leu Val Pro Asp Pro Pro Asn
20 25 30
Asp Leu Arg Lys Glu Asp Val Ala Met Glu Leu Glu Arg Val Gly Glu
35 40 45
Asp Glu Glu Gln Met Met Ile Lys Arg Ser Ser Glu Cys Asn Pro Leu
50 55 60
Leu Gln Glu Pro Ile Ala Ser Ala Gln Phe Gly Ala Thr Ala Gly Thr
65 70 75 80
Glu Cys Arg Lys Ser Val Pro Cys Gly Trp Glu Arg Val Val Lys Gln
85 90 95
Arg Leu Phe Gly Lys Thr Ala Gly Arg Phe Asp Val Tyr Phe Ile Ser
100 105 110
Pro Gln Gly Leu Lys Phe Arg Ser Lys Ser Ser Leu Ala Asn Tyr Leu
115 120 125
His Lys Asn Gly Glu Thr Ser Leu Lys Pro Glu Asp Phe Asp Phe Thr
130 135 140
Val Leu Ser Lys Arg Gly Ile Lys Ser Arg Tyr Lys Asp Cys Ser Met
145 150 155 160
Ala Ala Leu Thr Ser His Leu Gln Asn Gln Ser Asn Asn Ser Asn Trp
165 170 175
Asn Leu Arg Thr Arg Ser Lys Cys Lys Lys Asp Val Phe Met Pro Pro
180 185 190
Ser Ser Ser Ser Glu Leu Gln Glu Ser Arg Gly Leu Ser Asn Phe Thr
195 200 205
Ser Thr His Leu Leu Leu Lys Glu Asp Glu Gly Val Asp Asp Val Asn
210 215 220
Phe Arg Lys Val Arg Lys Pro Lys Gly Lys Val Thr Ile Leu Lys Gly
225 230 235 240
Ile Pro Ile Lys Lys Thr Lys Lys Gly Cys Arg Lys Ser Cys Ser Gly
245 250 255
Phe Val Gln Ser Asp Ser Lys Arg Glu Ser Val Cys Asn Lys Ala Asp
260 265 270
Ala Glu Ser Glu Pro Val Ala Gln Lys Ser Gln Leu Asp Arg Thr Val
275 280 285
Cys Ile Ser Asp Ala Gly Ala Cys Gly Glu Thr Leu Ser Val Thr Ser
290 295 300
Glu Glu Asn Ser Leu Val Lys Lys Lys Glu Arg Ser Leu Ser Ser Gly
305 310 315 320
Ser Asn Phe Cys Ser Glu Gln Lys Thr Ser Gly Ile Ile Asn Lys Phe
325 330 335
Cys Ser Ala Lys Asp Ser Glu His Asn Glu Lys Tyr Glu Asp Thr Phe
340 345 350
Leu Glu Ser Glu Glu Ile Gly Thr Lys Val Glu Val Val Glu Arg Lys
355 360 365
Glu His Leu His Thr Asp Ile Leu Lys Arg Gly Ser Glu Met Asp Asn
370 375 380
Asn Cys Ser Pro Thr Arg Lys Asp Phe Thr Gly Glu Lys Ile Phe Gln
385 390 395 400
Glu Asp Thr Ile Pro Arg Thr Gln Ile Glu Arg Arg Lys Thr Ser Leu
405 410 415
Tyr Phe Ser Ser Lys Tyr Asn Lys Glu Ala Leu Ser Pro Pro Arg Arg
420 425 430
Lys Ala Phe Lys Lys Trp Thr Pro Pro Arg Ser Pro Phe Asn Leu Val
435 440 445

Gln Glu Thr Leu Phe His Asp Pro Trp Lys Leu Leu Ile Ala Thr Ile
 450 455 460
 Phe Leu Asn Arg Thr Ser Gly Lys Met Ala Ile Pro Val Leu Trp Lys
 465 470 475 480
 Phe Leu Glu Lys Tyr Pro Ser Ala Glu Val Ala Arg Thr Ala Asp Trp
 485 490 495
 Arg Asp Val Ser Glu Leu Leu Lys Pro Leu Gly Leu Tyr Asp Leu Arg
 500 505 510
 Ala Lys Thr Ile Val Lys Phe Ser Asp Glu Tyr Leu Thr Lys Gln Trp
 515 520 525
 Lys Tyr Pro Ile Glu Leu His Gly Ile Gly Lys Tyr Gly Asn Asp Ser
 530 535 540
 Tyr Arg Ile Phe Cys Val Asn Glu Trp Lys Gln Val His Pro Glu Asp
 545 550 555 560
 His Lys Leu Asn Lys Tyr His Asp Trp Leu Trp Glu Asn His Glu Lys
 565 570 575
 Leu Ser Leu Ser
 580

<210> 3
 <211> 46
 <212> DNA
 <213> Artificial Sequence

<220>
 <221> mobility shift assay oligonucleotide

<220>
 <221> misc_feature
 <222> (0)...(0)
 <223> n at any position = methylcytosine

<400> 3
 gcgaattcng tgcgangaag cnggacgatn gaccagnct cgagca

46

<210> 4
 <211> 46
 <212> DNA
 <213> Artificial Sequence

<220>
 <221> mobility shift assay oligonucleotide

<220>
 <221> misc_feature
 <222> (0)...(0)
 <223> n at any position = methylcytosine

<400> 4
 gtgctcgagn gctggtngat cgtcnggctt ngtcgcangg aattcg

46

<210> 5
 <211> 1514
 <212> DNA
 <213> Mus musculus

<400> 5
 caaggaagat attgctgttg gactgggagg agtgggagaa gatggaaagg acctggtgat 60
 aagcagttag cgcagctccc ttctccaaga gccactgct totactctgt ctagtactac 120
 agcgacagaa ggccacaagc ctgtcccggt tggatgggaa agagttgtga agcaaagggt 180
 atctgggaaa actgcaggaa aatttgatgt atactttatc agcccacaag gattgaagtt 240
 caggatcaaa acgttcactt gctaattatc ttctcaaaaa tggggagact tttcttaagc 300
 ctgaagattt taattttact gtactgccga aaggagagcat caatcccggt tataaacacc 360

aaagtttggc	agctctgact	tccctgcagc	caaataaagc	tgacgtttca	aagcagaacc	420
tcaagacacg	aagcaagtgg	aaaacagatg	tggtgcctct	gcccagtggt	acttcagagt	480
cgccagaaaag	cagcggactg	tctaactcta	actcggcttg	cttgctattg	agagaacata	540
gggacattca	ggatgttgac	tctgagaaga	ggagaaaagtc	caaaagaaaag	gtgactgttt	600
tgaaaaggaac	tgcaagtcag	aaaaccaaac	aaaagtgacg	gaagagtctc	ttagagtcta	660
ctcaaaagaaa	cagaaaaaga	gcattctgtg	ttcagaagggt	gggtgctgat	cgcgagctgg	720
tgccacagga	aagtcaactc	aacagaaccc	tctgcccctgc	agatgcctgt	gcaaggggaga	780
ctgtttggcct	ggctggggaa	gaaaaatcac	caagcccagg	actggatctt	tgtttcatac	840
aagtaacttc	tggcaccaca	aacaaattcc	attcaactga	agcagcaggt	gaagcaaatc	900
gtgagcagac	tttttttagaa	tcagaggaaa	tcagatcgaa	gggagacaga	aagggggagg	960
cacattttgca	tactgggtgt	ttacaggatg	gctctgaaat	gcccagctgc	tcacaagcca	1020
agaaacactt	tacttctgag	acatttcaag	aagacagcat	cccacggaca	caagtagaaa	1080
aaagggaaaac	aagcctgtat	ttttccagca	agtacaacaa	agaagctctt	agccccccaa	1140
gacgcaaatac	cttcaagaaa	tggaacccctc	ctcggtcacc	ttttaatctt	gttcaagaaa	1200
tactttttcca	tgaccatgg	aagctcctca	tcgcgactat	atttctcaat	cggacctcag	1260
gcaagatggc	catccctgtg	ctgtgggagt	ttctagagaa	gtacccttca	gctgaagtgg	1320
cccagagctgc	cgactggagg	gacgtgtcgg	agcttctcaa	gcctcttggt	ctctacgatc	1380
tccgtgcaaaa	aacattatca	agttctcaga	tgaatatctg	acaaagcagt	ggaggtatcc	1440
gattgagctt	catgggattt	ggttaaaaata	tggaacgcac	tctaccggat	cttttgtgtc	1500
aatgaatgga	acag					1514

<210> 6
 <211> 19
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> PCR primer

<400> 6		
gtctggggcg	ctttcgcaa	19

<210> 7
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> PCR primer

<400> 7		
ccacacactg	tccactctcc	cg
		22

<210> 8
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> PCR primer

<400> 8		
actcccatag	cacaagactg	g
		21

<210> 9
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> PCR primer

<400> 9
 gctatgctcc cactacctgc 20

<210> 10
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> PCR primer

<400> 10
 cccttctatt tactagcagt a 21

<210> 11
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> PCR primer

<400> 11
 gatgcagcat ataaatttct c 21

<210> 12
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> PCR primer

<400> 12
 tgcacccctc aatattgctt t 21

<210> 13
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> PCR primer

<400> 13
 tcaattcagt gctttctccc t 21

<210> 14
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> PCR primer

<400> 14
 agcccacctg gagtcttgta a 21

<210> 15
 <211> 21

<212> DNA
 <213> Artificial Sequence

 <220>
 <223> PCR primer

 <400> 15
 aaagtttaag gtgtggctct c 21

<210> 16
 <211> 21
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> PCR primer

 <400> 16
 gaagctgacc tgataatgtg g 21

<210> 17
 <211> 21
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> PCR primer

 <400> 17
 cttattttgc ctcagagacc a 21

<210> 18
 <211> 21
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> PCR primer

 <400> 18
 tatcgtaatg tactgtcccc c 21

<210> 19
 <211> 21
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> PCR primer

 <400> 19
 gcttttagcaa ggctgataga a 21

<210> 20
 <211> 21
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> PCR primer

<400> 20
 caaatcttcc tgctgtcttc c

21

<210> 21
 <211> 261
 <212> DNA
 <213> Mus musculus

<400> 21
 ggttttgttt ttccagcaag gaagatattg ctgttggact gggaggagtg ggagaagatg 60
 gaaaggacct ggtgataagc agtgagcgca gctcccttct ccaagagccc actgcttcta 120
 ctctgtctag tactacagcg acagaaggcc acaagcctgt cccgtgtgga tgggaaagag 180
 ttgtgaagca aaggttatct gggaaaactg caggaaaatt tgatgtatac tttatcaggt 240
 aagcatttag gaaggaaaat a 261

<210> 22
 <211> 419
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (0)...(0)
 <223> n at any position may be a, t, c, or g

<400> 22
 gcggcgcgct ctggggcgct ttcgcaacat tcagacctcg gttgcagccc ggtgcgctga 60
 gctgaagagg ttccacatct tactccgccc cacaccttgg gcgttgcggc gctgggctcg 120
 ttgctgcagc cggaccttgc tcgatgggca cgactgggct ggagagtctg agtctggggg 180
 accgcgagc tgccccacc gtcacctcta gtgagcgctt agtcccagac ccgccgaatg 240
 acctcggta agttactgtc cctttttggg cctcagtttc accacctgta aaatgggtatc 300
 gggagagtgg acagtgtgtg ggcttttcta acctttgaca gagggtcggc anaaacctcg 360
 aagcccacgg gtttagttac tagggctctg agcccagggt ctcttctctg gcgatcagc 419

<210> 23
 <211> 2134
 <212> DNA
 <213> Homo sapiens

<400> 23
 ggcgcgctct gggcgcttt cgcaacattc agacctcggt tgcagcccgg tgccgtgagc 60
 tgaagaggtt tcacatctta ctccgcccc cacctgggc gttgcggcgc tgggctcggt 120
 gctgcagcgg gacctgtct gatgggcacg actgggctgg agagtctgag tctgggggac 180
 cgcgagctg cccccaccgt cacctctagt gaggcgctag tcccagacct gccgaatgac 240
 ctccgcaaag aagatgttgc tatggaattg gaaagagtgg gagaagatga ggaacaaatg 300
 atgataaaaa gaagcagtga atgtaatccc ttgctacaag aacctatcgc ttctgtctcag 360
 ttgggtgcta ctgcaggaa acgaatgccgt aagtctgtcc catgtggatg ggaagagatt 420
 gtgaagcaaa ggttatattg gaagacagca ggaagatttg atgtgtactt tatcagccca 480
 caaggactga agttcagatc caaaagtcca ctgtctaatt atcttcacaa aaatggagag 540
 acttctctta agccagaaga ttttgatttt actgtacttt ctaaaagggg tatcaagtca 600
 agatataaag actgcagcat ggcagccctg acatcccatc taaaaacca aagtaacaat 660
 tcaactgga acctcaggac ccgaagcaag tgcaaaaagg atgtgtttat gccgccaagt 720
 agtagttcag agttgcagga gagcagagga ctctctaact ttacttccac tcatttgctt 780
 ttgaaagaag atgaggggtg tgatgatgtt aacttcagaa aggttagaaa gcccaaagga 840
 aaggtgacta ttttgaaagg aatcccaatt aagaaaacta aaaaaggatg taggaagagc 900
 tgttcagggt ttgttcaaaag tgatagcaaa agagaatctg tgtgtaataa agcagatgct 960
 gaaagtgaac ctgttgacaa aaaaagtcag ctgatagaa ctgtctgcat ttctgatgct 1020
 ggagcatgtg gtgagacctt cagtgtgacc agtgaagaaa acagccttgt aaaaaaaaaa 1080
 gaaagatcat tgagttcagg atcaaatatt tgttctgaac aaaaaacttc tggcatcata 1140
 aacaaatttt gttcagccaa agactcagaa cacaacgaga agtatgagga taccttttta 1200
 gaatctgaag aaatcggaac aaaagtagaa gttgtggaaa ggaaagaaca ttgtcatact 1260
 gacattttta aacgtggctc tgaaatggac acaactgct caccaaccag gaaagacttc 1320
 actgaagata ccattcccac aacacagata gaaagaagga aaacaagcct gtattttttc 1380

agcaaatata	acaaagaagc	tcttagcccc	ccacgacgta	aagcctttaa	gaaatggaca	1440
cctcctcggt	caccttttaa	tctcggtcaa	gaaacacttt	ttcatgatcc	atggaagctt	1500
ctcatcgcta	ctatatctct	caatcggacc	tcaggcaaaa	tggcaatacc	tgtgctttgg	1560
aagtttctgg	agaagtatcc	ttcagctgag	gtagcaagaa	ccgcagactg	gagagatgtg	1620
tcagaacttc	ttaaaccctct	tggtctctac	gatcttcggg	caaaaaccat	tgtcaagttc	1680
tcagatgaat	acctgacaaa	gcagtgggaag	tatccaattg	agcttcatgg	gattgggtaaa	1740
tatggcaacg	actcttaccg	aattttttgt	gtcaatgagt	ggaagcaggt	gcaccctgaa	1800
gaccacaaat	taaataaata	tcatgactgg	ctttgggaaa	atcatgaaaa	attaagttta	1860
tcttaaactc	tgcagctttc	aagctcatct	gttatgcata	gctttgcact	tcaaaaaagc	1920
ttaattaagt	acaaccaacc	acctttccag	ccatagagat	tttaattagc	ccaactagaa	1980
gcctagtgtg	tgtgctttct	taatgtgtgt	gccaatgggtg	gatctttgct	actgaatgtg	2040
tttgaacatg	ttttgagatt	tttttaaaat	aaattattat	ttgacaacaa	aaaaaaaaaa	2100
aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaa			2134

<210> 24
 <211> 574
 <212> PRT
 <213> Homo sapiens

<400> 24

Met	Gly	Thr	Thr	Gly	Leu	Glu	Ser	Leu	Ser	Leu	Gly	Asp	Arg	Gly	Ala
1				5				10						15	
Ala	Pro	Thr	Val	Thr	Ser	Ser	Glu	Arg	Leu	Val	Pro	Asp	Pro	Pro	Asn
			20					25					30		
Asp	Leu	Arg	Lys	Glu	Asp	Val	Ala	Met	Glu	Leu	Glu	Arg	Val	Gly	Glu
	35						40					45			
Asp	Glu	Glu	Gln	Met	Met	Ile	Lys	Arg	Ser	Ser	Glu	Cys	Asn	Pro	Leu
	50					55					60				
Leu	Gln	Glu	Pro	Ile	Ala	Ser	Ala	Gln	Phe	Gly	Ala	Thr	Ala	Gly	Thr
65					70					75				80	
Glu	Cys	Arg	Lys	Ser	Val	Pro	Cys	Gly	Trp	Glu	Arg	Val	Val	Lys	Gln
			85					90					95		
Arg	Leu	Phe	Gly	Lys	Thr	Ala	Gly	Arg	Phe	Asp	Val	Tyr	Phe	Ile	Ser
			100					105					110		
Pro	Gln	Gly	Leu	Lys	Phe	Arg	Ser	Lys	Ser	Ser	Leu	Ala	Asn	Tyr	Leu
		115					120					125			
His	Lys	Asn	Gly	Glu	Thr	Ser	Leu	Lys	Pro	Glu	Asp	Phe	Asp	Phe	Thr
	130					135					140				
Val	Leu	Ser	Lys	Arg	Gly	Ile	Lys	Ser	Arg	Tyr	Lys	Asp	Cys	Ser	Met
145					150					155				160	
Ala	Ala	Leu	Thr	Ser	His	Leu	Gln	Asn	Gln	Ser	Asn	Asn	Ser	Asn	Trp
			165					170						175	
Asn	Leu	Arg	Thr	Arg	Ser	Lys	Cys	Lys	Lys	Asp	Val	Phe	Met	Pro	Pro
			180					185					190		
Ser	Ser	Ser	Ser	Glu	Leu	Gln	Glu	Ser	Arg	Gly	Leu	Ser	Asn	Phe	Thr
	195					200					205				
Ser	Thr	His	Leu	Leu	Leu	Lys	Glu	Asp	Glu	Gly	Val	Asp	Asp	Val	Asn
	210					215					220				
Phe	Arg	Lys	Val	Arg	Lys	Pro	Lys	Gly	Lys	Val	Thr	Ile	Leu	Lys	Gly
225					230					235				240	
Ile	Pro	Ile	Lys	Lys	Thr	Lys	Lys	Gly	Cys	Arg	Lys	Ser	Cys	Ser	Gly
			245					250						255	
Phe	Val	Gln	Ser	Asp	Ser	Lys	Arg	Glu	Ser	Val	Cys	Asn	Lys	Ala	Asp
			260					265					270		
Ala	Glu	Ser	Glu	Pro	Val	Ala	Gln	Lys	Ser	Gln	Leu	Asp	Arg	Thr	Val
	275						280					285			
Cys	Ile	Ser	Asp	Ala	Gly	Ala	Cys	Gly	Glu	Thr	Leu	Ser	Val	Thr	Ser
	290					295					300				
Glu	Glu	Asn	Ser	Leu	Val	Lys	Lys	Lys	Glu	Arg	Ser	Leu	Ser	Ser	Gly
305					310					315				320	
Ser	Asn	Phe	Cys	Ser	Glu	Gln	Lys	Thr	Ser	Gly	Ile	Ile	Asn	Lys	Phe
			325					330						335	
Cys	Ser	Ala	Lys	Asp	Ser	Glu	His	Asn	Glu	Lys	Tyr	Glu	Asp	Thr	Phe
		340						345					350		
Leu	Glu	Ser	Glu	Glu	Ile	Gly	Thr	Lys	Val	Glu	Val	Val	Glu	Arg	Lys

355										360										365									
Glu	His	Leu	His	Thr	Asp	Ile	Leu	Lys	Arg	Gly	Ser	Glu	Met	Asp	Asn														
370						375					380																		
Asn	Cys	Ser	Pro	Thr	Arg	Lys	Asp	Phe	Thr	Glu	Asp	Thr	Ile	Pro	Arg														
385					390					395				400															
Thr	Gln	Ile	Glu	Arg	Arg	Lys	Thr	Ser	Leu	Tyr	Phe	Ser	Ser	Lys	Tyr														
				405					410					415															
Asn	Lys	Glu	Ala	Leu	Ser	Pro	Pro	Arg	Arg	Lys	Ala	Phe	Lys	Lys	Trp														
		420						425					430																
Thr	Pro	Pro	Arg	Ser	Pro	Phe	Asn	Leu	Val	Gln	Glu	Thr	Leu	Phe	His														
	435						440					445																	
Asp	Pro	Trp	Lys	Leu	Leu	Ile	Ala	Thr	Ile	Phe	Leu	Asn	Arg	Thr	Ser														
450					455					460																			
Gly	Lys	Met	Ala	Ile	Pro	Val	Leu	Trp	Lys	Phe	Leu	Glu	Lys	Tyr	Pro														
465				470						475				480															
Ser	Ala	Glu	Val	Ala	Arg	Thr	Ala	Asp	Trp	Arg	Asp	Val	Ser	Glu	Leu														
			485					490						495															
Leu	Lys	Pro	Leu	Gly	Leu	Tyr	Asp	Leu	Arg	Ala	Lys	Thr	Ile	Val	Lys														
		500						505					510																
Phe	Ser	Asp	Glu	Tyr	Leu	Thr	Lys	Gln	Trp	Lys	Tyr	Pro	Ile	Glu	Leu														
	515					520						525																	
His	Gly	Ile	Gly	Lys	Tyr	Gly	Asn	Asp	Ser	Tyr	Arg	Ile	Phe	Cys	Val														
530					535					540																			
Asn	Glu	Trp	Lys	Gln	Val	His	Pro	Glu	Asp	His	Lys	Leu	Asn	Lys	Tyr														
545				550						555				560															
His	Asp	Trp	Leu	Trp	Glu	Asn	His	Glu	Lys	Leu	Ser	Leu	Ser																
			565					570																					

<210> 25
 <211> 2152
 <212> DNA
 <213> Homo sapiens

<400> 25										
ggcggcgctct	ggggcgcttt	cgcaacattc	agacctcggt	tgcagcccgg	tgccgtgagc					60
tgaagaggtt	tcacatctta	ctccgcccc	cacctgggc	ggtgcggcgc	tgggctcggt					120
gctgcagccg	gacctgctc	gatgggcacg	actgggctgg	agagtctgag	tctgggggac					180
cgcggagctg	ccccaccgt	cacctctagt	gagcgccctag	tccagaccc	gccgaatgac					240
ctccgcaaaag	aagatgttgc	tatggaattg	gaaagagtgg	gagaagatga	ggaacaaatg					300
atgataaaaa	gaagcagtga	atgtaatccc	ttgctacaag	aaccctatgc	ttctgctcag					360
tttgggtgcta	ctgcaggaac	agaatgccgt	aagtctgtcc	catgtggatg	ggaaagagtt					420
gtgaagcaaaa	ggttatttgg	gaagacagca	ggaagatttg	atgtgtactt	tatcagccca					480
caaggactga	agttcagatc	caaaagttca	cttgctaatt	atcttcacaa	aaatggagag					540
acttctctta	agccagaaga	ttttgatatt	actgtacttt	ctaaaagggg	tatcaagtca					600
agatataaag	actgcagcat	ggcagccctg	acatccctac	tacaaaacca	aagtaacaat					660
tcaaaactgga	acctcaggac	cgaagcgaag	tgcaaaaagg	atgtgtttat	gccgccaaat					720
agtagttcag	agttgcagga	gagcagagga	ctctctaact	ttacttccac	tcatttgctt					780
ttgaaagaag	atgaggggtg	tgatgatgtt	aacttcagaa	agggttagaaa	gccccaaagg					840
aaggtgacta	ttttgaaagg	aatcccaatt	aagaaaacta	aaaaaggatg	taggaagagc					900
tgttcagggt	ttgttcaaaag	tgatagcaaa	agagaatctg	tgtgtaataa	agcagatgct					960
gaaagtgaac	ctgttgacaa	aaaaagtcag	cttgatagaa	ctgtctgcat	ttctgatgct					1020
ggagcatgtg	gtgagaccct	cagtgtgacc	agtgaagaaa	acagccttgt	aaaaaaaaaa					1080
gaaagatcat	tgagttcagg	atcaaatctt	tgttctgaac	aaaaaacttc	tggcctcata					1140
aacaaatttt	gttcagccaa	agactcagaa	cacaacgaga	agtatgagga	taccttttta					1200
gaatctgaag	aaatcggaac	aaaagtagaa	gttgtggaaa	ggaaagaaca	tttgcatact					1260
gacattttta	aacgtggctc	tgaaatggac	aacaactgct	caccaaccag	gaaagacttc					1320
actggtgaga	aaatatttca	agaagatacc	atcccacgaa	cacagataga	aagaaggaaa					1380
acaagcctgt	atttttccag	caaatataac	aaagaagctc	ttagcccccc	acgacgtaaa					1440
gcctttaaga	aatggacacc	tcctcggtca	ccttttaate	tcgttcaaga	aacacttttt					1500
catgatccat	ggaagcttct	catcgctact	atatttctca	atcggacctc	aggcaaaatg					1560
gcaataacctg	tgctttggaa	gtttctggag	aagtatcctt	cagctgaggt	agcaagaacc					1620
gcagactgga	gagatgtgtc	agaacttctt	aaacctcttg	gtctctacga	tcttcgggca					1680
aaaaccattg	tcaagttctc	agatgaatac	ctgacaaaagc	agtggaaagta	tccaattgag					1740
cttcatggga	ttggtaaata	tggcaacgac	tcttaccgaa	ttttttgtgt	caatgagtgg					1800
aagcaggtgc	accctgaaga	ccacaaatta	aataaatatc	atgactgggt	ttgggaaaat					1860

catgaaaaat	taagtctatc	ttaaactctg	cagctttcaa	gctcatctgt	tatgcatagc	1920
tttgcacttc	aaaaaagctt	aattaagtac	aaccaaccac	ctttccagcc	atagagattt	1980
taattagccc	aactagaagc	ctagtgtgtg	tgctttctta	atgtgtgtgc	caatgggtgga	2040
tctttgtctac	tgaatgtgtt	tgaacatggt	ttgagatttt	tttaaaataa	attattattt	2100
gacaacaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aa	2152

<210> 26
 <211> 2152
 <212> DNA
 <213> Homo sapiens

<400> 26						
ggcggcgctct	ggggcgcttt	cgcaacattc	agacctcggt	tgcagcccg	tgccgtgagc	60
tgaagaggtt	tcacatctta	ctccgcccc	cacctgggc	gttgccggcg	tgggctcgtt	120
gctgcagccg	gacctgtctc	gatgggcacg	actgggctgg	agagtctgag	tctgggggac	180
cgcggaagctg	ccccaccgt	cacctctagt	gagcgccctag	tcccagaccc	gccgaatgac	240
ctccgcaaaag	aagatgttgc	tatggaattg	gaaagagtgg	gagaagatga	ggaacaaatg	300
atgataaaaa	gaagcagtga	atgtaatccc	ttgctacaag	aacctatcgc	ttctgtctag	360
tttggtgcta	ctgcaggaac	agaatgccgt	aagtctgtcc	catgtggatg	ggaaagagtt	420
gtgaagcaaa	ggttatttgg	gaagacagca	ggaagatttg	atgtgtactt	tatcagccca	480
caaggactga	agttcagatc	caaaagtcca	cttgctaatt	atcttcacaa	aaatggagag	540
acttctctta	agccagaaga	ttttgatttt	actgtacttt	ctaaaagggg	tatcaagtca	600
agatataaaag	actgcagcat	ggcagccctg	acatcccatc	tacaaaacca	aagtaacaat	660
tcaaactgga	acctcaggac	ccgaagcaag	tgcaaaaagg	atgtgtttat	gccgcccaagt	720
agtagttcag	agttgcagga	gagcagagga	ctctctaact	ttacttccac	tcatttgctt	780
ttgaaagaag	atgaggggtg	tgatgatggt	aacttcagaa	agggttagaa	gccccaaagg	840
aagggtgacta	ttttgaaagg	aatcccaatt	aagaaaacta	aaaaaggatg	taggaagagc	900
tggttcagggt	ttgttcaaaag	tgatagcaaa	agagaatctg	tgtgtaataa	agcagatgct	960
gaaagtgaac	ctggtgcaca	aaaaagtccg	cttgatagaa	ctgtctgcat	ttctgatgct	1020
ggagcatgtg	gtgagaccct	cagtgtgacc	agtgaagaaa	acagccttgt	aaaaaaaaaa	1080
gaaagatcat	tgagttcagg	atcaaatttt	tggtctgaac	aaaaaacttc	tggcatcata	1140
aacaattttt	gttcagccaa	agactcagaa	cacaacgaga	agtatgagga	taccttttta	1200
gaatctgaag	aaatcggaac	aaaagttagaa	gttggtgaaa	ggaaagaaca	tttgcatact	1260
gacattttta	aacgtggctc	tgaaatggac	aacaactgct	caccaaccag	gaaagacttc	1320
actggtgaga	aaatattttc	agaagatacc	atcccacgaa	cacagataga	aagaaggaaa	1380
acaagcctgt	atTTTTccag	caaataaac	aaagaagctc	ttagccccc	acgacgtaaa	1440
gcctttaaga	aatggacacc	tcctcggtca	ccttttaatc	tcgttcaaga	aacacttttt	1500
catgatccat	ggaagcttct	catcgctact	atattttctc	atcggacctc	aggcaaaatg	1560
gcaataacctg	gtttttggaa	gtttctggag	aagtatacct	cagctgaggt	agcaagaacc	1620
gcagactgga	gagatgtgtc	agaacttctt	aaacctcttg	gtctctacga	tcttcgggca	1680
aaaaccattg	tcaagttctc	agatgaatac	ctgacaaaagc	agtggaagta	tccaattgag	1740
cttcatggga	ttggtaaaata	tggcaacgac	tcttaccgaa	ttttttgtgt	caatgagtgg	1800
aagcaggtgc	accctgaaga	ccacaaatta	aataaatatc	atgactggct	ttgggaaaat	1860
catgaaaaat	taagttttatc	ttaaactctg	cagctttcaa	gctcatctgt	tatgcatagc	1920
tttgcacttc	aaaaaagctt	aattaagtac	aaccaaccac	ctttccagcc	atagagattt	1980
taattagccc	aactagaagc	ctagtgtgtg	tgctttctta	atgtgtgtgc	caatgggtgga	2040
tttttgctac	tgaatgtgtt	tgaacatggt	ttgagatttt	tttaaaataa	attattattt	2100
gacaacaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aa	2152

<210> 27
 <211> 2152
 <212> DNA
 <213> Homo sapiens

<400> 27						
ggcggcgctct	ggggcgcttt	cgcaacattc	agacctcggt	tgcagcccg	tgccgtgagc	60
tgaagaggtt	tcacatctta	ctccgcccc	cacctgggc	gttgccggcg	tgggctcgtt	120
gctgcagccg	gacctgtctc	gatgggcacg	actgggctgg	agagtctgag	tctgggggac	180
cgcggaagctg	ccccaccgt	cacctctagt	gagcgccctag	tcccagaccc	gccgaatgac	240
ctccgcaaaag	aagatgttgc	tatggaattg	gaaagagtgg	gagaagatga	ggaacaaatg	300
atgataaaaa	gaagcagtga	atgtaatccc	ttgctacaag	aacctatcgc	ttctgtctag	360
tttggtgcta	ctgcaggaac	agaatgccgt	aagtctgtcc	catgtggatg	ggaaagagtt	420
gtgaagcaaa	ggttatttgg	gaagacagca	ggaagatttg	atgtgtactt	tatcagccca	480
caaggactga	agttcagatc	caaaagtcca	cttgctaatt	atcttcacaa	aaatggagag	540

acttctctta	agccagaaga	ttttgatttt	actgtacttt	ctaaaagggg	tatcaagtca	600
agataataag	actgcagcat	ggcagccctg	acatcccato	tacaaaacca	aagtaacaat	660
tcaaactgga	acctcaggac	ccgaagcaag	tgcaaaaagg	atgtgtttat	gccgccaaat	720
agtagttcag	agttgcagga	gagcagagga	ctctctaact	ttacttccac	tcatttgctt	780
ttgaaagaag	atgaggggtg	tgatgatgtt	aacttcagaa	agggttagaaa	gccccaaagga	840
aaggtgacta	ttttgaaaag	aatcccaatt	aagaaaacta	aaaaaggatg	taggaagagc	900
tgttcaggtt	ttgttcaaaag	tgatagcaaa	agagaatctg	tgtgtaataa	agcagatgct	960
gaaagtgaac	ctgttgcaca	aaaaagtcag	cttgatagaa	ctgtctgcat	ttctgatgct	1020
ggagcatgtg	gtgagaccct	cagtgtgacc	agtgaagaaa	acagccttgt	aaaaaaaaaa	1080
gaaagatcat	tgagttcagg	atcaaatatt	tgttctgaac	aaaaaacttc	tggcatcata	1140
aacaaatttt	gttcagccaa	agactcagaa	cacaacgaga	agtatgagga	taccttttta	1200
gaatctgaag	aaaccggaac	aaaagtagaa	gttgtggaaa	ggaaagaaca	tttgcatact	1260
gacattttta	aacgtggctc	tgaaatggac	aacaactgct	caccaaccag	gaaagacttc	1320
actggtgaga	aaatattttca	agaagatacc	atcccacgaa	cacagataga	aagaaggaaa	1380
acaagcctgt	atttttccag	caaatataac	aaagaagctc	ttagcccccc	acgacgtaaa	1440
gcctttaaga	aatggacacc	tcctcgggtc	ccttttaatc	tcgttcaaga	aacacttttt	1500
catgatccat	ggaagcttct	catcgctact	atattttctc	atcggacctc	aggcaaaatg	1560
gcaataacctg	tgctttggaa	gtttctggag	aagtatcctt	cagctgaggt	agcaagaacc	1620
gcagatcggg	gagatgtgtc	agaacttctt	aaacctcttg	gtctctacga	tcttcgggca	1680
aaaaccattg	tcaagtcttc	agatgaatac	ctgacaagac	agtggaaagta	tccaattgag	1740
cttcatggga	ttggttaaata	tggaacacgac	tcttacggaa	ttttttgtgt	caatgagtgg	1800
aagcaggtgc	accctgaaga	ccacaaatta	aataaatatc	atgactggct	ttgggaaaat	1860
catgaaaaat	taagtttatc	ttaaactctg	cagctttcaa	gctcatctgt	tatgcatagc	1920
tttgactctc	aaaaaagctt	aattaagtac	aaccaaccac	ctttccagcc	atagagattt	1980
taattagccc	aactagaagc	ctagtgtgtg	tgctttctta	atgtgtgtgc	caatgggtgga	2040
tttttgctac	tgaatgtgtt	tgaacatggt	ttgagatttt	tttaaaataa	attattattt	2100
gacaacaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aa	2152

<210> 28
 <211> 942
 <212> DNA
 <213> Homo sapiens

ggaagcaggt	gaggctcact	cccatccata	attcagcaca	tttgggtctct	gaggcaaaat	60
aagtccacca	ttatgggttaa	gactattttat	tggatacaaa	tgctattaca	gtcacaaaaca	120
attgtgtttcc	tggctgcggg	gaagcgagtg	gcatgtgggt	tttgggggttt	ttgatcagta	180
agcgctccca	agtccacaaa	gaccagtcca	gcggcggtggc	ctctgactca	tctccagtgg	240
tttgtcacct	ctggcctgt	tcctgtcatt	ccctatttgt	gtgctatctc	taagcctgac	300
gtgggttttcc	tcctgtcaaa	agtacaccac	tacaggaaag	caggaaaggtt	tgggccttgc	360
aatgtatgca	tattgggttt	ctcttagtgg	tctcagacta	cgtttgtggt	gactgggtcc	420
tgcttcagcc	ctgttgaata	tgcccagcct	gtggcatgct	ggtgggtcatc	ctggcagctg	480
gtgggtggcc	tggtatgctg	cccactcagc	ttgagactca	ccctcatgca	ttcagccagt	540
aggtctggcc	aagcctgaac	tgaaggacca	tggtcctatc	ccagcttcat	cacagcaatc	600
cattgtgacc	tgagaatcca	tttaacctct	cggtctagaa	cctccttctg	gaaagtgagg	660
tattaatact	tgactcaatg	ttatcgccac	cccacattct	aagtcatggt	tgagtagtaa	720
tttgagacgt	accttgtaaa	ttgtgtgaga	ttaccttaat	ataaggtata	acttaaaata	780
ttcatgaatc	ccaggaggtt	aaagggttata	acttttaggt	atgggtatcgt	aatgtactgt	840
ccccagcaa	acatttaaaa	agccaatttt	aaaaaatgta	tttctgacta	agttacatta	900
aggtctctgc	ctctgtatct	tatgtttctt	ccagggtgcac	cc		942

<210> 29
 <211> 384
 <212> PRT
 <213> Mus musculus

<400> 29															
Lys	Glu	Asp	Ile	Ala	Val	Gly	Leu	Gly	Gly	Val	Gly	Glu	Asp	Gly	Lys
1				5				10						15	
Asp	Leu	Val	Ile	Ser	Ser	Glu	Arg	Ser	Ser	Leu	Leu	Gln	Glu	Pro	Thr
			20					25					30		
Ala	Ser	Thr	Leu	Ser	Ser	Thr	Thr	Ala	Thr	Glu	Gly	His	Lys	Pro	Val
		35					40					45			
Pro	Cys	Gly	Trp	Glu	Arg	Val	Val	Lys	Gln	Arg	Leu	Ser	Gly	Lys	Thr

50	55	60
Ala Gly Lys Phe Asp Val Tyr Phe Ile Ser Pro Gln Gly Leu Lys Phe		
65	70	75
Arg Ser Lys Arg Ser Leu Ala Asn Tyr Leu Lys Asn Gly Glu Thr		80
	85	90
Phe Leu Lys Pro Glu Asp Phe Asn Phe Thr Val Leu Pro Lys Gly Ser		95
	100	105
Ile Asn Pro Gly Tyr Lys His Gln Ser Leu Ala Ala Leu Thr Ser Leu		110
	115	120
Gln Pro Asn Glu Thr Asp Val Ser Lys Gln Asn Leu Lys Thr Arg Ser		125
	130	135
Lys Trp Lys Thr Asp Val Leu Pro Leu Pro Ser Gly Thr Ser Glu Ser		140
145	150	155
Pro Glu Ser Ser Gly Leu Ser Asn Ser Asn Ser Ala Cys Leu Leu Leu		160
	165	170
Arg Glu His Arg Asp Ile Gln Asp Val Asp Ser Glu Lys Arg Arg Lys		175
	180	185
Ser Lys Arg Lys Val Thr Val Leu Lys Gly Thr Ala Ser Gln Lys Thr		190
	195	200
Lys Gln Lys Cys Arg Lys Ser Leu Leu Glu Ser Thr Gln Arg Asn Arg		205
210	215	220
Lys Arg Ala Ser Glu Asp Ser Ile Pro Arg Thr Gln Val Glu Lys Arg		225
225	230	235
Lys Thr Ser Leu Tyr Phe Ser Ser Lys Tyr Asn Lys Glu Ala Leu Ser		240
	245	250
		255
Pro Pro Arg Arg Lys Ser Phe Lys Lys Trp Thr Pro Pro Arg Ser Pro		
	260	265
Phe Asn Leu Val Gln Glu Ile Leu Phe His Asp Pro Trp Lys Leu Leu		270
	275	280
Ile Ala Thr Ile Phe Leu Asn Arg Thr Ser Gly Lys Met Ala Ile Pro		285
290	295	300
Val Leu Trp Glu Phe Leu Glu Lys Tyr Pro Ser Ala Glu Val Ala Arg		305
	310	315
Ala Ala Asp Trp Arg Asp Val Ser Glu Leu Leu Lys Pro Leu Gly Leu		320
	325	330
Tyr Asp Leu Arg Ala Lys Thr Ile Ile Lys Phe Ser Asp Glu Tyr Leu		335
	340	345
Thr Lys Gln Trp Arg Tyr Pro Ile Glu Leu His Gly Ile Trp Leu Lys		350
	355	360
Tyr Gly Asn Asp Ser Tyr Arg Ile Phe Cys Val Asn Glu Trp Lys Gln		365
370	375	380

<210> 30
 <211> 119
 <212> PRT
 <213> Homo sapiens

<400> 30
Lys Glu Asp Val Ala Met Glu Leu Glu Arg Val Gly Glu Asp Glu Glu
1 5 10 15
Gln Met Met Ile Lys Arg Ser Ser Glu Cys Asn Pro Leu Leu Gln Glu
20 25 30
Pro Ile Ala Ser Ala Gln Phe Gly Ala Thr Ala Gly Thr Glu Cys Arg
35 40 45
Lys Ser Val Pro Cys Gly Trp Glu Arg Val Val Lys Gln Arg Leu Phe
50 55 60
Gly Lys Thr Ala Gly Arg Phe Asp Val Tyr Phe Ile Ser Pro Gln Gly
65 70 75 80
Leu Lys Phe Arg Ser Lys Ser Ser Leu Ala Asn Tyr Leu His Lys Asn
85 90 95
Gly Glu Thr Ser Leu Lys Pro Glu Asp Phe Asp Phe Thr Val Leu Ser
100 105 110
Lys Arg Gly Ile Lys Ser Arg
115

<210> 31
 <211> 132
 <212> PRT
 <213> Rattus

<400> 31
 Lys Glu Asp Lys Glu Gly Lys His Glu Pro Leu Gln Pro Ser Ala His
 1 5 10 15
 His Ser Ala Glu Pro Ala Glu Ala Gly Lys Ala Glu Thr Ser Glu Ser
 20 25 30
 Ser Gly Ser Ala Pro Ala Val Pro Glu Ala Ser Ala Ser Pro Lys Gln
 35 40 45
 Arg Arg Ser Ile Ile Arg Asp Arg Gly Pro Met Tyr Asp Asp Pro Thr
 50 55 60
 Leu Pro Glu Gly Trp Thr Arg Lys Leu Lys Gln Arg Lys Ser Gly Arg
 65 70 75 80
 Ser Ala Gly Lys Tyr Asp Val Tyr Leu Ile Asn Pro Gln Gly Lys Ala
 85 90 95
 Phe Arg Ser Lys Val Glu Leu Ile Ala Tyr Phe Glu Lys Val Gly Asp
 100 105 110
 Thr Ser Leu Asp Pro Asn Asp Phe Asp Phe Thr Val Thr Gly Arg Gly
 115 120 125
 Ser Pro Ser Arg
 130

<210> 32
 <211> 126
 <212> PRT
 <213> Homo sapiens

<400> 32
 Asp Pro Trp Lys Leu Leu Ile Ala Thr Ile Phe Leu Asn Arg Thr Ser
 1 5 10 15
 Gly Lys Met Ala Ile Pro Val Leu Trp Lys Phe Leu Glu Lys Tyr Pro
 20 25 30
 Ser Ala Glu Val Ala Arg Thr Ala Asp Trp Arg Asp Val Ser Glu Leu
 35 40 45
 Leu Lys Pro Leu Gly Leu Tyr Asp Leu Arg Ala Lys Thr Ile Val Lys
 50 55 60
 Phe Ser Asp Glu Tyr Leu Thr Lys Gln Trp Lys Tyr Pro Ile Glu Leu
 65 70 75 80
 His Gly Ile Gly Lys Tyr Gly Asn Asp Ser Tyr Arg Ile Phe Cys Val
 85 90 95
 Asn Glu Trp Lys Gln Val His Pro Glu Asp His Lys Leu Asn Lys Tyr
 100 105 110
 His Asp Trp Leu Trp Glu Asn His Glu Lys Leu Ser Leu Ser
 115 120 125

<210> 33
 <211> 184
 <212> PRT
 <213> E. coli

<400> 33
 Ser Pro Phe Glu Leu Leu Ile Ala Val Leu Leu Ser Ala Gln Ala Thr
 1 5 10 15
 Asp Val Ser Val Asn Lys Ala Thr Ala Lys Leu Tyr Pro Val Ala Asn
 20 25 30
 Thr Pro Ala Ala Met Leu Glu Leu Gly Val Glu Gly Val Lys Thr Tyr
 35 40 45
 Ile Lys Thr Ile Gly Leu Tyr Asn Ser Lys Ala Glu Asn Ile Ile Lys

50	55	60
Thr Cys Arg Ile Leu Leu Glu Gln His Asn Gly Glu Val Pro Glu Asp		
65	70	75
Arg Ala Ala Leu Glu Ala Leu Pro Gly Val Gly Arg Lys Thr Ala Asn		80
	85	90
Val Val Leu Asn Thr Ala Phe Gly Trp Pro Thr Ile Ala Val Asp Thr		95
	100	105
His Ile Phe Arg Val Cys Asn Arg Thr Gln Phe Ala Pro Gly Lys Asn		110
	115	120
Val Glu Gln Val Glu Glu Lys Leu Leu Lys Val Val Pro Ala Glu Phe		125
	130	135
Lys Val Asp Cys His His Trp Leu Ile Leu His Gly Arg Tyr Thr Cys		140
145	150	155
Ile Ala Arg Lys Pro Arg Cys Gly Ser Cys Ile Ile Glu Asp Leu Cys		160
	165	170
Glu Tyr Lys Glu Lys Val Asp Ile		175
	180	

<210> 34
 <211> 188
 <212> PRT
 <213> M. thermoformicum

<400> 34
Asp Pro Tyr Val Ile Leu Ile Thr Glu Ile Leu Leu Arg Arg Thr Thr
1 5 10 15
Ala Gly His Val Lys Lys Ile Tyr Asp Lys Phe Phe Val Lys Tyr Lys
20 25 30
Cys Phe Glu Asp Ile Leu Lys Thr Pro Lys Ser Glu Ile Ala Lys Asp
35 40 45
Ile Lys Glu Ile Gly Leu Ser Asn Gln Arg Ala Glu Gln Leu Lys Glu
50 55 60
Leu Ala Arg Val Val Ile Asn Asp Tyr Gly Gly Arg Val Pro Arg Asn
65 70 75 80
Arg Lys Ala Ile Leu Asp Leu Pro Gly Val Gly Lys Tyr Thr Cys Ala
85 90 95
Ala Val Met Cys Leu Ala Phe Gly Lys Lys Ala Ala Met Val Asp Ala
100 105 110
Asn Phe Val Arg Val Ile Asn Arg Tyr Phe Gly Gly Ser Tyr Glu Asn
115 120 125
Leu Asn Tyr Asn His Lys Ala Leu Trp Glu Leu Ala Glu Thr Leu Val
130 135 140
Pro Gly Gly Lys Cys Arg Asp Phe Asn Leu Gly Leu Met Asp Phe Ser
145 150 155 160
Ala Ile Ile Cys Ala Pro Arg Lys Pro Lys Cys Glu Lys Cys Gly Met
165 170 175
Ser Lys Leu Cys Ser Tyr Tyr Glu Lys Cys Ser Thr
180 185

<210> 35
 <211> 185
 <212> PRT
 <213> M. luteus

<400> 35
Thr Pro Phe Glu Leu Leu Val Ala Thr Val Leu Ser Ala Gln Thr Thr
1 5 10 15
Asp Val Arg Val Asn Ala Ala Thr Pro Ala Leu Phe Ala Arg Phe Pro
20 25 30
Asp Ala His Ala Met Ala Ala Ala Thr Glu Pro Glu Leu Gln Glu Leu
35 40 45
Val Arg Ser Thr Gly Phe Tyr Arg Asn Lys Ala Ser Ala Ile Leu Arg
50 55 60
Leu Ser Gln Glu Leu Val Gly Arg His Asp Gly Glu Val Pro Ala Arg

<210> 38
 <211> 76
 <212> PRT
 <213> Homo sapiens

<400> 38
 Met Ala Glu Asp Trp Leu Asp Cys Pro Ala Leu Gly Pro Gly Trp Lys
 1 5 10 15
 Arg Arg Glu Val Phe Arg Lys Ser Gly Ala Thr Cys Gly Arg Ser Asp
 20 25 30
 Thr Tyr Tyr Gln Ser Pro Thr Gly Asp Arg Ile Arg Ser Lys Val Glu
 35 40 45
 Leu Thr Arg Tyr Leu Gly Pro Ala Cys Asp Leu Thr Leu Phe Asp Phe
 50 55 60
 Lys Gln Gly Ile Leu Cys Tyr Pro Ala Pro Lys Ala
 65 70 75

<210> 39
 <211> 24
 <212> DNA
 <213> Homo sapiens

<400> 39
 taaaaaaaaa agaaagatca ttga 24

<210> 40
 <211> 14
 <212> DNA
 <213> Homo sapiens

<400> 40
 gaaagatcat tgag 14

<210> 41
 <211> 16
 <212> DNA
 <213> Homo sapiens

<400> 41
 taaaaaagga tgtagg 16

<210> 42
 <211> 10
 <212> DNA
 <213> Homo sapiens

<400> 42
 ggatgtagga 10

<210> 43
 <211> 17
 <212> PRT
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (0)...(0)

<223> Xaa at any position = any amino acid

<400> 43

Cys Xaa Xaa Xaa Xaa Xaa Xaa Cys Xaa Xaa Cys Xaa Xaa Xaa Xaa Xaa
1 5 10 15
Cys

<210> 44

<211> 866

<212> DNA

<213> Mus musculus

<400> 44

cttttttttt	ttccttttaa	gcccacaagg	attgaagttc	agatcaaaac	gttcacttgc	60
taattatctt	ctcaaaaatg	gggagacttt	tcttaagcct	gaagatttta	atcttactgt	120
actgccgaaa	gggagcatca	atcccgggta	taaacaccaa	agtttggcag	ctctgacttc	180
cctgcagcca	aatgaaactg	acgtttcaaa	gcagaacctc	aagacacgaa	gcaagtggaa	240
aacagatgtg	ttgcctctgc	ccagtgggtac	ttcagagtcg	ccagaaagca	gcggactgtc	300
taactctaac	tcggcttgct	tgctattgag	agaacatagg	gacattcagg	atgttgactc	360
tgagaagagg	agaaaagtcca	aaagaaaggt	gactgttttg	aaagggaactg	caagtcagaa	420
aaccaaacaa	aagtgcagga	agagtctctt	agagtctact	caaagaaaca	gaaaaagagc	480
atctgtgggt	cagaagggtg	gtgctgatcg	cgagctgggtg	ccacaggaaa	gtcaactcaa	540
cagaaccttc	tgccctgcag	atgcctgtgc	aagggagact	gttggcctgg	ctggggaaga	600
aaaatcacca	agcccaggac	tggatctttg	tttcatacaa	gtaacttctg	gcaccacaaa	660
caaattccat	tcaactgaag	cagcaggtga	agcaaatcgt	gagcagactt	ttttagaatc	720
agaggaaatc	agatcgaagg	gagacagaaa	gggggaggca	catttgcata	ctgggtgtttt	780
acaggatggc	tctgaaatgc	ccagctgctc	acaagccaag	aaacacttta	cttctgagac	840
atttcaagggt	actcagtgc	tgaaaa				866

<210> 45

<211> 121

<212> DNA

<213> Mus musculus

<400> 45

gactataaac	taattttgct	tctcagaaga	cagcatccca	cggacacaag	tagaaaaaag	60
gaaaacaagc	ctgtattttt	ccagcaagta	caacaaagaa	ggtaccacc	tttccctaag	120
c						121

<210> 46

<211> 166

<212> DNA

<213> Mus musculus

<220>

<221> misc_feature

<222> (0)...(0)

<223> n at any position may be a, t, c, or g

<400> 46

tatatttntg	nagctcttag	cccccaaga	cgaaatcct	tcaagaaatg	gacccctcct	60
cggtcacctt	ttaatcttgt	tcaagaaata	cttttccatg	acccatggaa	gtcctcctc	120
gcgactatat	ttctcaatcg	gacctcaggt	tnggggtcat	tgncat		166

<210> 47

<211> 183

<212> DNA

<213> Mus musculus

<400> 47

tgtttatgct	ccccaggcaa	gatggccatc	cctgtgctgt	gggagtttct	agagaagtac	60
ccttcagctg	aagtggccc	agctgccgac	tggagggacg	tgctcgagct	tctcaagcct	120

cttgggtctct acgatctccg tgcaaaaacc attatcaagt tctcaggtat gtccccagcc 180
cag 183

<210> 48
<211> 143
<212> DNA
<213> Mus musculus

<400> 48
tggatgtgta tccctcagat gaatatctga caaagcagtg gaggtatccg attgagcttc 60
atgggatttg gttaaaatat ggcaacgact ctaccggatc ttttgtgtca atgaatggaa 120
caggaagcc caccactggg gcc 143

<210> 49
<211> 810
<212> DNA
<213> Homo sapiens

<400> 49
tttggaagac aggaaatact cccatagcac aagactgggc cacactgact ttaatctccc 60
tcattttaat atggataatc tatgtgggtc ctgcattgtc atggattaaa actgagtagg 120
cagtgggaaga taaattttta ataatgttaat cacttagact ttgtttttcc agcaaagaag 180
atgttgctat ggaattggaa agagtgggag aagatgagga acaaatgatg ataaaaagaa 240
gcagtgaatg taatcccttg ctacaagaac ccacgccttc tgctcagttt ggtgctactg 300
caggaacaga atgccgtaag tctgtcccat gtggatggga aagagtgtgt aagcaaaggt 360
tatttgggaa gacagcagga agatttgatg tgtactttat caggtaagca tataagatgg 420
taaagatagt acagccaaat gattttgtct gggcaggtag tgggagcata gcaggaatct 480
tagcttcttt atatttttac cataaaacca ttgcagatcc tattctttca atgttgctat 540
taattacatc aagtgatttg gggaaaatta catacatttt gtcctctcct ctgtgaatgg 600
ttaacgggta ggttgcatth tagttatatt tataaattta tattgtcata gaggaacct 660
ttaaaaggcc attatcactc tttttcattt ttaaatgaca gagacctatg gcaacatttg 720
gaaattaatt agaactctgaa atgtgggtcca gttcttttaa aagtcctctc tatttactag 780
cagtaagtth cctttaatat cattttctag 810

<210> 50
<211> 1017
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (0)...(0)
<223> n at any position may be a, t, c, or g

<400> 50
aatctgaaat gtgggtccagt tcttttataaa gtcccttcta tttactagca gtaagtttcc 60
tttaatatca ttttctagcc cacaaggact gaagttcaga tccaaaagtt cacttgctaa 120
ttatcttcac aaaaatggag agacttctct taagccagaa gattttgatt ttactgtact 180
ttctaaaagg ggtatcaagt caagatataa agactgcagc atggcagccc tgacatccca 240
tctacaaaac caaagtaaca attcaaactg gaacctcagg acccgaaagca agtgcaaaaa 300
ggatgtgttt atgccgcaa gtagtgttc agagtgcag gagagcagag gactctctaa 360
ctttacttcc actcatttgc ttttgaaaga agatgagggg gttgatgatg ttaacttcag 420
aaagggttaga aagcccaaag gaaaggtgac tattttgaaa ggaatcccaa ttaagaaaac 480
taaaaaagga tgtaggaaga gctgttcagg tttgttcaa agtgatagca aaaganaatc 540
tgtgtgtaat aaagcagatg ctgaaagtga acctgttgca caaaaaagtc agcttgatag 600
aactgtctgc atttctgatg ctggagcatg tgggtgagacc ctcatgtgtg gcagtgaaga 660
aaacngcctt gtaaaaaaaa aagaaagatc attgagtcca ggatcaaatt tttgttctga 720
acaaaaaact tctggcatca taaacaaatt ttgttcagcc aaagactcag aacacaagca 780
gaagtatgag gatacctttt tagaatctga agaaatcgga acaaaaagtag aagttgtgga 840
aaggaaagaa catttgcata ctgacatttt aaaacgtggc tctgaaatgg acaacaactg 900
ctaccaacc aggaaagact tcaactgtga gaaaatattt caaggtatcc agtgctttca 960
gcactattaa acattagtga tgagaaatth atatgctgca tctgtatcgt gccatac 1017

<210> 51
 <211> 613
 <212> DNA
 <213> Homo sapiens

<400> 51
 tagtaccaag ttcattgggtc attagttaga ttaattgggt atttatgtaa agggcttaga 60
 atagtgcctg gcatgctttg taatagtgtt gatattatta tttgcatccc tcaatattgc 120
 ttttaagctaa accatagact ccataaagtg tttacttttc cttttcagaa gataccatcc 180
 cacgaacaca gatagaaaga aggaaaacaa gcctgtattt ttccagcaaa tataacaaag 240
 aaggtatccc tttcccaatc agaacagcaa attctaattc cattttgggt tttcaattct 300
 gatgcactat gtttggttag ctcttagccc cccacgacgt aaagccttta agaaatggac 360
 acctcctcgg tcacctttta atctcgttca agaaacactt tttcatgatc catggaagct 420
 tctcatcgct actatatttc tcaatcggac ctcaggtttg gggattatta tcatctttgt 480
 cttagtagag acagtgtggg agggagaaag cactgaattg aggcctgggt tcaaagtcac 540
 tttgagtggt tcacctggga tagggcattc cccctttcac ccttaaactc ttcacctatg 600
 aggaaaatgg ggg 613

<210> 52
 <211> 463
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (0)...(0)
 <223> n at any position may be a, t, c, or g

<400> 52
 ccagtgtttt ttgttttttg ttttctttaa aaaaaaaaaa aaaccctctg gatgagattt 60
 ctatgagaaa ctacttgaac gtgaaatcag cccacctgga gtcttgtaat cattcagtta 120
 cttttacntt cccaggcaaa atggcaatac ctgtgctttg gaagtttctg gagaagtatc 180
 cttcagctga ggtagcaaga accgcagact ggagagatgt gtcagaactt cttaaacctc 240
 ttggtctcta cgatcttcgg gcaaaaacca ttgtcaagtt ctcaggtatt ttcctataca 300
 cccaaaggaa aaacataata cattgtgctt atttaagaga gccacacctt aaactttaat 360
 gttctcagat actatattaa tggaggtttt tcagctcaag catttaaaaa agtccacttt 420
 tccccaaacc acagtctccc actgacctaa acaataaatc ttt 463

<210> 53
 <211> 332
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (0)...(0)
 <223> n at any position may be a, t, c, or g

<400> 53
 ctttagaagc tgacctgata atgtgggatg ttgtattctt cagatgaata cctgacaaaag 60
 cagtgggaagt atccaattga gcttcatggg attggtaaatt atggcaacga ctcttaccga 120
 attttttgtg tcaatgagtg gaagcagggt aggcctactc ccatccataa ttcagcacat 180
 ttggtctctg aggcaaaata agtccacatc tatggttaag acnattttatt ggggatacaa 240
 atgctattac agtcacaaca attgtgttcc tggctgcggg gaagcngtg gcattgtgggt 300
 tttgggggtt ttgatcagta ggcgtcccca gg 332

<210> 54
 <211> 623
 <212> DNA
 <213> Homo sapiens

<220>

<221> misc_feature
 <222> (0)...(0)
 <223> n at any position may be a, t, c, or g

<400> 54
 tgtgtgagat taccttaata taaggtataa cttaaaatat tcatgaatcc caggagggtta 60
 aagggtataa ctttttaggtat tggatcgtat atgtactgtc cccagcaaaa catttaaaaa 120
 gccaatTTta aaaaatgtat ttctgactaa gttacatnta aggtctctgc ctctgtatct 180
 tatgtttctt ccaggtgcac cctgaagacc acaaattaaa taaatatcat gactggcctt 240
 cccaaaatca tgaaaaatta agtttatctt aaactctgca gctttcaagc tcattctgtta 300
 tgcattgctt tgcacttcaa aaaagcttaa ttaagtacaa ccaaccacct ttccagccat 360
 agagatttta attagcccaa ctagaagcct agtgtgtgtg ctttcttaat gtgtgtgcca 420
 atgggtggatc tttgctactg aatgtgtttg aacatgtttt gagatttttt taaaataaat 480
 tattatttga caacaatcca aaaaaaatac ggcttttcca atgatgaaat ataatcagaa 540
 gatgaaaaat agttctaaac tatcaataat acaaagcaaa tttctatcag ccttgctaaa 600
 gctaggggccc cactaaatat ttt 623

<210> 55
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 55
 ctctgtgtgt tctgagcttt tggc 24

<210> 56
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 56
 cagtgtgacc agtgaagaaa a 21

<210> 57
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 57
 tgaaaggaat cccaattaag 20

<210> 58
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 58
 gacagttcta tcaagctgac 20

<210> 59
<211> 63
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic oligonucleotide

<221> misc_feature
<222> (34)...(34)
<223> n = a, g, c, t

<400> 59
ccgtcatgct agttcacttt atgcttccgg ctncgctcat gtgtggaatt gtgattaaaa 60
tcg 63

<210> 60
<211> 63
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic oligonucleotide

<221> misc_feature
<222> (31)...(31)
<223> n = a, g, c, t, u, e

<221> modified_base
<222> (31)...(31)
<223> e = ethenocytosine

<400> 60
gcgattttaa tcacaattcc acacatgacg ngagccggaa gcataaagtg aactagcatg 60
acg 63

<210> 61
<211> 63
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic oligonucleotide

<221> misc_feature
<222> (33)...(33)
<223> n = a, g, c, t

<400> 61
ccgtcatgct agttcacttt atgcttccgg ctncgctcat gtgtggaatt gtgattaaaa 60
tcg 63

<210> 62
<211> 63
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic oligonucleotide

<221> misc_feature
<222> (31)...(31)
<223> n = t, u

<221> misc_feature
<222> (32)...(32)
<223> n = a, g, c, t

<400> 62
gcgatttttaa tcacaattcc acacatgacg nnagccggaa gcataaagtg aactagcatg 60
acg 63

<210> 63
<211> 64
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic oligonucleotide

<221> misc_feature
<222> (35)...(35)
<223> n = a, g, c, t

<400> 63
ccgtcatgct agttcacttt atgcttccgg ctgcncgtca tgtgtggaat tgtgattaaa 60
atcg 64

<210> 64
<211> 65
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic oligonucleotide

<400> 64
ccgtcatgct agttcacttt atgcttccgg ctcggtcgtc atgtgtggaa ttgtgattaa 60
aatcg 65

<210> 65
<211> 66
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic oligonucleotide

<400> 65
ccgtcatgct agttcacttt atgcttccgg ctcggtacgt catgtgtgga attgtgatta 60
aaatcg 66

<210> 66
<211> 67
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic oligonucleotide

<400> 66
ccgtcatgct agttcacttt atgcttccgg ctcggtaccg tcatgtgtgg aattgtgatt 60
aaaatcg 67

<210> 67
<211> 68
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic oligonucleotide

<400> 67
ccgtcatgct agttcacttt atgcttccgg ctcggtactc gtcatgtgtg gaattgtgat 60
taaaatcg 68

<210> 68
<211> 68
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic oligonucleotide

<400> 68
ccgtcatgct agttcacttt atgcttccgg ctcggggggc gtcatgtgtg gaattgtgat 60
taaaatcg 68

<210> 69
<211> 62
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic oligonucleotide

<400> 69
ccgtcatgct agttcacttt atgcttccgg ctcggtcatg tgtggaattg tgattaaaaat 60
cg 62

<210> 70
<211> 63
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic oligonucleotide

<400> 70
gcgattttaa tcacaattcc acacatgacg cgagccggaa gcataaagtg aactagcatg 60
acg 63

<210> 71
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic oligonucleotide

<400> 71
caatcctagc tgacacgatg tggccaatgg catgact 37

<210> 72
<211> 37

<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic oligonucleotide

<221> misc_feature
<222> (22)...(22)
<223> n = c, t, u, e

<221> modified_base
<222> (22)...(22)
<223> e = ethenocytosine

<400> 72
gagtcatgcc attggccaca tngtgtcagc taggatt

37

<210> 73
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> synthetic oligonucleotide

<400> 73
gacttcactg gtgagaaaat atttcaaggt

30